

In the Claims:

1 - 17 (canceled).

18. (new) A separator for electrochemical systems, comprising:

a first conductive plate having a face; and

a second conductive plate having a face;

wherein each plate includes a series of projections extending outwardly therefrom; wherein each of the projections have a corresponding cavity defined on the opposite side thereof;

wherein when the faces of the first and second plates are brought into an overlapping relationship, at least a subset of the cavities of the first plate engage a subset of the cavities of the second plate to provide at least one flow path between the first plate and the second plate.

19. (new) The separator of claim 18 wherein the cavities of the first plate are dissimilar in shape from the cavities of the second plate.

20. (new) The separator of claim 19 wherein the cavities of the second plate comprise a plurality of generally parallel channels.

21. (new) The separator of claim 18 wherein the at least one flow path between the first plate and the second plate defines at least one flow path for cooling fluid.

22. (new) The separator of claim 18 wherein at least one of the projections of the first plate and the projections of the second plate define a flow path for media distribution.

23. (new) The separator of claim 22 wherein the projections of the first plate define a flow path for distributing a fuel medium on the anode side of a fuel cell.

24. (new) The separator of claim 22 wherein the projections of the second plate define a flow path for distributing a media on the cathode side of a fuel cell.

25. (new) The separator of claim 24 wherein the media is one of air and oxygen.

26. (new) A method of manufacturing a separator for electrochemical systems comprising:

providing a first conductive plate having a face and a second conductive plate having a face;

each plate including a series of projections extending outwardly therefrom;

each of the projections having a corresponding cavity defined on the opposite side thereof;

bringing the first conductive plate and the second conductive plate into an overlapping relationship, engaging at least a subset of the cavities of the first plate with at least a subset of the cavities of the second plate, thereby providing at least one flow path between the first plate and the second plate; and

joining the first conductive plate and the second conductive plate.

27. (new) The method of claim 26 including the step of forming the cavities of the first plate in a dissimilar shape to the cavities of the second plate.

28. (new) The method of claim 26 wherein including the step of forming the cavities of at least one plate using at least one of the processes of roller embossing, punching, hydroforming and eddy current embossing.

29. (new) The method of claim 26 wherein the step of joining the first conductive plate and the second conductive plate is performed by one of soldering, bonding and laser welding.

30. (new) A electrochemical system including:

a first fuel cell, a second fuel cell and a bipolar plate;

said bipolar plate being interposed between the first fuel cell and the second fuel cell;

the bipolar plate comprising:

a first conductive plate having a face; and

a second conductive plate having a face;

wherein each conductive plate includes a series of projections extending outwardly therefrom; wherein each of the projections have a corresponding cavity defined on the opposite side thereof;

wherein when the faces of the first and second plates are brought into an overlapping relationship, at least a subset of the cavities of the first plate engage a subset of the cavities of the second plate to provide at least one flow path between the first plate and the second plate;

wherein the projections of the first plate define a flow path for distributing a fuel medium on the anode side of the first fuel cell; and

wherein the projections of the second plate define a flow path for distributing a medium on the cathode side of the second fuel cell.

31. (new) The electrochemical system of claim 30 wherein the electrochemical system is a polymer electrolyte membrane system.

32. (new) The electrochemical system of claim 30 wherein the second fuel cell is a self-breathing fuel cell.

33. (new) The process of using a separator in an electrochemical system including the steps of:

providing at least one separator having a first conductive plate having a face and a second conductive plate having a face;

each plate including a series of projections extending outwardly therefrom;

each of the projections having a corresponding cavity defined on the opposite side thereof;

bringing the first conductive plate and the second conductive plate into an overlapping relationship, engaging at least a subset of the cavities of the first plate with at least a subset of the cavities of the second plate, thereby providing at least one flow path between the first plate and the second plate; and

joining the first conductive plate and the second conductive plate;

installing the at least one separator in an electrochemical system; and

providing a media on a first side of the separator and providing a media on a second side of the separator.

34. (new) The process of claim 33 wherein the electrochemical system is a fuel cell.

35. (new) The process of claim 34 wherein the fuel cell is a self breathing fuel cell.

36. (new) The process of claim 33 wherein the electrochemical system is an electrochemical processor.